

An ATM switch with rate-limiting congestion control has a plurality of input ports, a plurality of output ports operatively associated with one or more data buffers, an output control and a switch fabric for switching data units from any of the input ports to any of the output ports on virtual connections. The ATM switch imposes and enforces transmission rate-limiting policies against the virtual connections when the backlog of data units for delivery to a particular output port reaches a particular level. The ATM switch may be arranged to exempt high priority data units from the imposed rate limitations and has a means to lift the rate limitations when the backlog has been sufficiently reduced.